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Answer & Solutions

for

NEET 2022

Biology

101. Which one of the following statement is not true regarding gel electrophoresis technique?

(1) The presence of chromogenic substrate give blue coloured DNA bands on the gel

(2) Bright orange coloured bands of DNA can be observed in the gel when exposed to UV light

(3) The process of extraction of separated DNA strands from gel is called elution.

(4) The separated DNA fragments are stained by using ethidium bromide.

Sol. Answer (1)

Explanation: The use of chromogenic substrate is used during genetic engineering, not during Gel electrophoresis.

102. Given below are two statements

Statement I:

Mendel studied seven pairs of contrasting traits in pea plants and proposed the Laws of Inheritance.

Statement II :

Seven characters examined by Mendel in his experiment on pea plants were seed shape and colour, flower colour, pod shape and colour, flower position and stem height

In the light of the above statements, choose the correct answer from the options given below:

(1) **Statement I** is correct but **Statement II** is incorrect

(2) **Statement I** is incorrect but **Statement II** is correct

(3) Both **Statement I** and **Statement II** are correct

(4) Both **Statement I** and **Statement II** are incorrect

Sol. Answer (3)

Explanation: Both the statements are correct

103. Which of the following is incorrectly matched?

(1) *Porphyra* - Floridian Starch

(2) *Volvox* - Starch

(3) *Ectocarpus* - Fucoxanthin

(4) *Ulothrix* - Mannitol

Sol. Answer (4)

Explanation: The reserve food material found in *Ulothrix* (Green alga) is Starch.

104. XO type of sex determination can be found in :

(1) Grasshoppers

(2) Monkeys

(3) *Drosophila*

(4) Birds

Sol. Answer (1)

XO type of sex determination can be found in Grasshopper.

105. The appearance of recombination nodules on homologous chromosomes during meiosis characterizes:

(1) Sites at which crossing over occurs

(2) Terminalization

(3) Synaptonemal complex

(4) Bivalent

Sol. Answer (1)

Explanation: The appearance of recombination nodules on homologous chromosomes during meiosis characterizes the sites at which crossing over occurs.

106. Which of the following is **not** a method of ex situ conservation?

(1) Micropropagation

(2) Cryopreservation

(3) *Invitro* fertilization

(4) National Parks

Sol. Answer (4)

National parks are the example of in-situ conservation.

107. Identify the incorrect statement related to Pollination:

(1) Flowers produce, foul odours to attract flies and beetles to get pollinated

(2) Moths and butterflies are the most dominant pollinating agents among insects

(3) Pollination by water is quite rare in flowering plants

(4) Pollination by wind is more common amongst abiotic pollination

Sol. Answer (2)

Explanation: The most dominant pollinating agent among insects are Bees (80%).

108. Given below are two statements:

Statement I:

The primary CO_2 acceptor in C_4 plants is phosphoenolpyruvate and is found in the

mesophyll cells

Statement II:

Mesophyll cells of C4 plants lack RuBisCo enzyme. In the light of the above statements, choose the correct answer from the options given below:

(1) **Statement I** is correct but **Statement II** is incorrect

(2) **Statement I** is incorrect but **Statement II** is correct

(3) Both **Statement I** and **Statement II** are correct

(4) Both **Statement I** and **Statement II** are incorrect

Sol. Answer (3)

Explanation: The primary acceptor of CO_2 in C4 plants is PEP and is found in the mesophyll cells, whereas Rubisco enzyme is found in the bundle sheath cells where it helps in fixing CO_2 through C_3 cycle.

109. In old trees the greater part of secondary xylem is dark brown and resistant to insect attack due to:

(a) secretion of secondary metabolites and their deposition in the lumen of vessels.

(b) deposition of organic compounds like tannins and resins in the central layers of stem.

(c) deposition of suberin and aromatic substances in the outer layer of stem.

(d) deposition of tannins, gum, resin and aromatic substances in the peripheral layers of stem.

(e) presence of parenchyma cells, functionally active xylem elements and essential oils.

Choose the correct answer from the options given below:

(1) (d) and (e) Only

(2) (b) and (d) Only

(3) (a) and (b) Only

(4) (c)and(d)Only)

Sol. Answer (3)

Explanation: In older trees the greater part of secondary xylem is dark brown and resistant to insect attack due to secretion of secondary metabolites and their deposition in the lumen of vessels and deposition of organic compounds like tannins and resins in the central layer of stem.

110. Which one of the following produces nitrogen fixing nodules on the roots of *Alnus*?

(1) *Rhodospirillum*

(2) *Beijernickia*

(3) *Rhizobium*

(4) *Frankia*

Sol. Answer (4)

Explanation: *Frankia* is a gram positive species of actinomycete filamentous bacterium that lives in symbiosis with actinorhizal plants in the genus *Alnus*.

111. Given below are two statements:

Statement I :

Decomposition is a process in which the detritus is degraded into simpler substances by microbes.

Statement II :

Decomposition is faster if the detritus is rich in lignin and chitin

In the light of the above statements, choose the correct answer from the options given below :

(1) **Statement I** is correct but **Statement II** is incorrect

(2) **Statement I** is incorrect but **Statement II** is correct

(3) Both **Statement I** and **Statement II** are correct

(4) Both **Statement I** and **Statement II** are incorrect

Sol. Answer (1)

Explanation: Decomposition is the process of conversion of complex organic matter into simple inorganic matter. Under different environmental conditions, the rate of decomposition may vary. If detritus is rich in lignin and chitin, the rate of decomposition is low and for nitrogen rich detritus rate of decompostion is fast.

112. Habitat loss and fragmentation, over exploitation, alien species invasion and co-extinction are causes for:

(1) Biodiversity loss

(2) Natality

(3) Population explosion

(4) Competition

Sol. Answer (1)

Explanation: The evil quartet for biodiversity loss are

1. Habitat loss and fragmentation
2. Over exploitation
3. Alien species invasion
4. Co-extinction

113. Hydrocolloid carrageen is obtained from:

(1) Rhodophyceae only

(2) Phaeophyceae only

(3) Chlorophyceae and Phaeophyceae

(4) Phaeophyceae and Rhodophyceae

Sol. Answer (1)

Explanation: Hydrocolloid carrageen is obtained from red algae.

114. "Girdling Experiment" was performed by Plant Physiologists to identify the plant tissue through which:

(1) for both water and food transportation

(2) osmosis is observed

(3) water is transported

(4) food is transported

Sol. Answer (4)

Girdling experiment demonstrate that phloem is responsible for translocation of food because the phloem is present outside the xylem, so when a ring of bark is removed from a woody plant, the woody xylem part remains intact, which causes the water and the nutrients to reach the least.

115. The flowers are Zygomorphic in:

(a) Mustard

(b) Gulmohar

(c) *Cassia*

(d) *Datura*

(e) Chilly

Choose the correct answer from the options given

(1) (d), (e) Only

(2) (c), (d), (e) Only

(3) (a), (b), (c) Only

(4) (b), (c) Only

Sol. Answer (4)

Examples of zygomorphic flowers :

Gulmohar and *Cassia*

Examples of Actinomorphic flowers :

Mustard, *Datura* and Chilly

116. Which one of the following is not true regarding the release of energy during ATP synthesis through chemiosmosis ? It involves :

(1) Movement of protons across the membrane to the stroma

(2) Reduction of NADP to $NADPH_2$ on the stroma side of the membrane

(3) Breakdown of proton gradient

(4) Breakdown of electron gradient

Sol. Answer (4)

Explanation: According to chemiosmotic hypothesis, there is a breakdown of proton gradient by the movement of protons across the membrane to the stroma and reduction of NADP to NADPH2 on the stroma side of the membrane.

117. The device which can remove particulate matter present in the exhaust from a thermal power plant is:

(1) Electrostatic Precipitator

(2) Catalytic Convertor

(3) STP

(4) Incinerator

Sol. Answer (1)

Electrostatic Precipitators (ESP) are very efficient devices which remove 99% of the particulate present in the industrial and thermal plant exhaust.

118. Given below are two statements: one is labelled as **Assertion (A)** and other is labelled as **Reason (R).**

Assertion (A) :

Polymerase chain reaction is used in DNA amplification

Reason (R):

The ampicillin resistant gene is used as a selectable marker to check transformation

In the light of the above statements, choose the correct answer from the options given below:

(1) **(A)** is correct but **(R)** is not correct

(2) **(A)** is not correct but **(R)** is correct

(3) Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**

(4) Both **(A)** and **(R)** are correct but **(R)** is not the correct explanation of **(A)**

Sol. Answer (4)

- PCR enables the amplification of billions of copies of temtlate DNA.
- Antibiotic resistance genes *i.e.* amplicillin resistant and tetracycline resistant gene act as selectable markers to distinguish between transformant and non transformant, recombinant and non recombinant.

119. Which one of the following plants does not show plasticity?

(1) Buttercup

(2) Maize

(3) Cotton

(4) Coriander

Sol. Answer (2)

Plants follow different pathways in response to environment or phases of life to form different kinds of structures The ability is called plasticity, e.g., heterophylly in cotton, coriander and larkspur. In such plants, the leaves of the juvenile plant are different in shape from those in mature plants.

120. The process of translation of mRNA to proteins begins as soon as

(1) Both the subunit join together to bind rRNA

(2) The tRNA is activated and the larger subunit of ribosome encounters mRNA

(3) The small subunit of ribosome encounter mRNA

(4) The larger subunit of ribosome encounter mRNA

Sol. Answer (3)

Process of translation begins when small subunit of ribosome encounter mRNA.

121. Read the following statements and choose the set of correct statements

(a) Euchromatin is loosely packed chromatin

(b) Heterochromatin is transcriptionally active

(c) Histone octomer is wrapped by negative charged DNA in nucleosome

(d) Histones are rich in lysine and arginine

(e) A typical nucleosome contains 400 bp of DNA helix

Choose the correct answer from the options given below:

(1) (b), (e) Only

(2) (a),(c),(e)Only

(3) (b),(d),(e)Only

(4) (a), (c), (d) Only

Sol. Answer (4)

Euchromatin is loosely, lightly stained chromatin.

Heterochromatin is transcriptionally inactive.

A typical nucleosome contains 200 bp of DNA helix

122. Read the following statements about the vascular bundles :

(a) In roots, xylem and phloem in a vascular bundle are arranged in an alternate manner along the different radii.

(b) Conjoint closed vascular bundles do not possess cambium

(c) In open vascular bundles, cambium is present in between xylem and phloem

(d) The vascular bundles of dicotyledonous stem possess endarch protoxylem

(e) In monocotyledonous root, usually there are more than six xylem bundles present

Choose the correct answer from the options given below

(1) (a), (b), (c) and (d) Only

(2) (a), (c), (d) and (e) Only

(3) (a), (b) and (d) Only

(4) (b), (c), (d) and (e) Only

Sol. NA

123. Exoskeleton of arthropods is composed of

(1) Chitin

(2) Glucosamine

(3) Cutin

(4) Cellulose

Sol. Answer (1)

The exoskeleton of arthropods is composed of Chitin.

124. What is the net gain of ATP when each molecule of glucose is converted to two molecules of pyruvic acid?

(1) Two

(2) Eight

(3) Four

(4) Six

Sol. Answer (1)

One molecule of glucose undergoes glycolysis to form 4 molecules of ATP, two are used in activation phase so net gain is of 2 ATP.

125. Which of the following is not observed during apoplastic pathway?

(1) The movement is aided by cytoplasmic streaming

(2) Apoplast is continuous and does not provide any barrier to water movement.

(3) Movement of water occurs through intercellular spaces and wall of the cells

(4) The movement does not involve crossing of cell membrane

Sol. Answer (1)

Apoplastic pathway is not aided by cytoplasmic streaming

Cytoplasmic streaming helps in symplastic pathway.

126. Which one of the following plants shows vexillary aestivation and diadelphous stamens?

(1) *Allium cepa*

(2) *Solanum nigrum*

(3) *Colchicum*

(4) *Pisum sativum autumnale*

Sol. Answer (4)

Vexillary Aestivation and Diadelphous statements are feature of Fabaceae

Pisum sativum – Fabaceae

Solanum – Solanaceae

Colchicum, *Allium* – Liliaceae

127. DNA polymorphism forms the basis of:

(1) Both genetic mapping and DNA finger printing

(2) Translation

(3) Genetic mapping

(4) DNA finger printing

Sol. Answer (1)

DNA polymorphism is the basis of genetic mapping of genome and of DNA fingerprinting.

128. What amount of energy is released from glucose during lactic acid fermentation

(1) About 10%

(2) Less than 7%

(3) Approximately 15%

(4) More than 18%

Sol. Answer (2)

Less than 7% of energy is released in lactic acid and alcoholic fermentation

129. Identify the correct set of statements:

(a) The leaflets are modified into pointed hard thorns in Citrus and Bougainvillea

(b) Axillary buds form slender and spirally coiled tendrils in cucumber and pumpkin

(c) Stem is flattened and fleshy in Opuntia and modified to perform the function of leaves

(d) *Rhizophora* shows vertically upward growing roots that help to get oxygen for respiration

(e) Subaerially growing stems in grasses and strawberry help in vegetative propagation

Choose the correct answer from the options given below :

(1) (b), (c), (d) and (e) Only

(2) (a), (b), (d) and (e) Only

(3) (b) and (c) Only

(4) (a) and (d) Only

Sol. Answer (1)

Adventitious buds and not leaflets are modified into pointed hard thorns in Citrus and Bougainvillea

130. Which one of the following statements cannot be connected to Predation?

(1) Both the interacting species are negatively impacted

(2) It is necessitated by nature to maintain the ecological balance

(3) It helps in maintaining species diversity in a community

(4) It might lead to extinction of a species

Sol. Answer (1)

In Predation interaction, is + - i.e for species (Host) it is beneficial and for others (Prey) it is detrimental

131. Given below are two statements:

Statement I: Cleistogamous flowers are invariably autogamous

Statement II: Cleistogamy is disadvantageous as there is no chance for cross pollination

In the light of the above statements, choose the correct answer from the options given below :

(1) **Statement I** is correct but **Statement II** is incorrect

(2) **Statement** I is incorrect but Statement II is correct

(3) Both **Statement I** and **Statement II** arecorrect

(4) Both **Statement I** and **Statement II** are incorrect

Sol. Answer (3)

Both the statements are correct.

Cleistogamous flowers are close flowers so they are invariably autogamous and there is no chance of cross pollination due to which genetic diversity is reduced

132. Production of Cucumber has increased manifold in recent years. Application of which of the following phytohormones has resulted in this increased yield as the hormone is known to produce female flowers in the plants :

(1) Ethylene (2) Cytokinin

(3) ABA (4) Gibberellin

Sol. Answer (1)

In cucumbers, ethylene is responsible for promoting female flower production and thereby increasing the yield.

133. Match List- I with List- II.

(a) Manganese	(i) Activates the enzyme catalase
(b) Magnesium	(ii) Required for pollen germination
(c) Boron	(iii) Activates enzymes of respiration
(d) Iron	(iv) Functions in splitting of water during photosynthesis

Choose the **correct answer** from the options given below

(1) (a)-(iv), (b)- (i),(c)-(ii), (d)-(iii)

(2) (a)- (iii), (b)-(i), (c)-(ii), (d)- (iv)

(3) (a)-(iii), (b)- (iv), (c)-(i), (d)-(ii)

(4) (a)-(iv), (b)- (iii), (c)- (ii), (d)-(i)

Sol. Answer (4)

Iron – Activate catalase

Boron – Help in pollen germination

Manganese – Plays major role in splitting of water and release of oxygen during photosynthesis

Magnesium – Activate several enzymes during photosynthesis and respiration.

134. Which one of the following never occurs during mitotic cell division?

(1) Pairing of homologous chromosomes

(2) Coiling and condensation of the chromatids

(3) Spindle fibres attach to kinetochores of chromosomes

(4) Movement of centrioles towards opposite poles

Sol. Answer (1)

Pairing of homologous chromosome (Synapsis) occurs during meiosis

135. The gaseous plant growth regulator is used in plants to:

(1) help overcome apical dominance

(2) kill dicotyledonous weeds in the fields

(3) speed up the malting process

(4) promote root growth and root hair formation to increase the absorption surface

Sol. Answer (4)

Gaseous plant growth regulator is ethylene which helps in root growth and root hair absorption and therefore increases the surface area for absorption

136. Match the plant with the kind of life cycle it exhibits:

List-I	List-II
(a) *Spirogyra*	(i) Dominant diploid sporophyte vascular plant, with highly reduced male or female gametophyte
(b) Fern	(ii) Dominant haploid free-living gametophyte
(c) *Funaria*	(iii) Dominant diploid sporophyte alternating with reduced gametophyte called prothallus
(b) *Cycas*	(iv) Dominant haploid leafy gametophyte alternating with partially dependent multicellular sporophyte

Choose the correct answer from the options given below:

(1) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

(2) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

(3) (a)- (iv),(b)-(i), (c)-(ii), (d)- (iii)

(4) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

Sol. Answer (4)

• *Spirogyra* is a green alage, haplontic life cycle.

• Fern is a pteridophyte – Life cycle shows dominant diploid sporophyte, alternating with reduced free living gametophytic stage. So its Haplo-diplontic life cycle

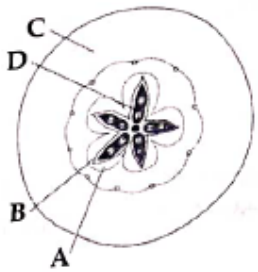
• *Funaria* – belongs to Bryophyta. Its a moss plant. Exhibits haplo diplontic lifecycle.

The free living haploid gametophyte bears the sporophytic plant body.

• *Cycas* – Gymnosperms.

Gymnosperms exhibit dominant diploid saprophytic plant body, with highly reduced male/female gametophyte.

137. Which part of the fruit, labelled in the given figure makes it a false fruit?



(1) C → Thalamus (2) D → Seed

(3) A → Mesocarp (4) B → Endocarp

Sol. Answer (1)

C → Thalamus

A fruit developed from fertilized ovary is true fruit.

Thalamus becomes fleshy and grows around the true fruit. This fleshy, juicy thalamus is edible part in apple. Hence it is a False fruit.

138. Which one of the following will accelerate phosphorus cycle ?

(1) Weathering of rocks

(2) Rainfall and storms

(3) Burning of fossil fuels

(4) Volcanic activity

Sol. Answer (1)

Phosphorus cycle – 'P' is sedimentary cycle.

The natural source of phosphates is phosphate rich rocks. So, phosphorus is obtained from weathering of phosphate rich rocks. Reservoir of 'P' is earths crust.

139. Match List - I with List - II.

List-I	List-II
(a) Metacentric chromosome	(i) Centromere situated close to the end forming one extremely short and one very longar
(b) Acrocentric chromosome	(ii) Centromere at the terminal end
(c) Sub- metacentric	(iii) Centromere in the middle forming two equal arms chromosomes
(d) Telocentric chromosome	Centromere slightly away from the middle forming one shorter arm and one longer arm

Choose the correct answer from the options given below:

(1) (a)-(ii), (b)-(iii), (c)- (iv), (d)-(i)

(2) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

(3) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

(4) (a)-(i), (b)- (iii), (c)- (ii), (d)- (iv)

Sol. Answer (3)

(a) Meta centric chromosome	-	Centromere is at the middle. Forms two equal arms of the chromosome
(b) Acrocentric chromosome	-	Position of centromer is close to the end – forms one very short arm and one very long arm.
c. Sub meta centric chromosome	-	Position of centromer is slightly away from the middle, as a result – one arm is shorter and one arm is onger.
d. Telocentric chromosome	-	Centromere is located terminal end.

140. The anatomy of springwood shows some peculiar features. Identify the correct set of statements about0020springwood.

(a) It is also called as the earlywood

(b) In spring season cambium produces xylem elements with narrow vessels

(c) It is lighter in colour

(d) The springwood along with autumnwood shows alternate concentric rings forming annual rings

(e) It has lower density

Choose the correct answer from the options given below:

(1) (a), (b) and (d) Only

(2) (c), (d) and (e) Only

(3) (a), (b), (d) and (e) Only

(4) (a), (c), (d) and (e) Only

Sol. Answer (4)

Based on the activity of cambium, in temperate regions – two types of woods ae conspicuously seen.

Cambium is more active during spring season, produce large no. of xylary elements with wide cavities and low density

During winters, cambium is less active, produce narrow xylary elements which are more dense – Autumn wood. Autumn wood also called as latewood

One ring of spring wood, one ring of autumn wood as alternate concentric rings – form one Annual ring

141. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason

Assertion (A): Mendel's law of Independent assortment does not hold good for the genes that are located closely on the same chromosome.

Reason (R): Closely located genes assort independently.

In the light of the above statements, choose the correct answer from the options given below:

(1) (A) is correct but **(R)** is not correct

(2) **(A)** is not correct but **(R)** is correct

(3) Both (A) and **(R)** are correct and **(R)** is the correct explanation of (A)

(4) Both **(A)** and **(R)** are correct but **(R)** is not the correct explanation of **(A)**

Sol. Answer (1)

Mendel's law of independent assortment based on dihybrid cross stated that when the inheritance pattern of two pair of genes were combinedly observed the segregation of one pair of alleles is independent of another pair of alleles. This law is true only when

• genes are present on separate chromosomes

• genes present on same chromosome but distantly placed from each other.

142. Read the following statements on lipids and find out correct set of statements:

(a) Lecithin found in the plasma membrane is a glycolipid

(b) Saturated fatty acids possess one or more c = c bonds

(c) Gingelly oil has lower melting point, hence remains as oil in winter

(d) Lipids are generally insoluble in water but soluble in some organic solvents

(e) When fatty acid is esterified with glycerol, monoglycerides are formed

Choose the correct answer from the options given below:

(1) (c), (d) and (e) only

(2) (a), (b) and (d) only

(3) (a), (b) and (c) only

(4) (a), (d) and (e) only

Sol. Answer (1)

Lecithin is a phospholipid, saturated fatty acids lack double bonds.

143. What is the role of large bundle shealth cells found around the vascular bundles in C_4 plants?

(1) To enable the plant to tolerate high temperature

(2) To protect the vascular tissue from high light intensity

(3) To provide the site for photorespiratory pathway

(4) To increase the number of chloroplast for the operation of Calvin cycle

Sol. Answer (4)

C4 plant has Kranz anatomy – large number of Bundle sheath cells around vascular bundles help for two things.

(a) makes these cells impervious to gases

(b) increase the number of chloroplasts for operation of Calvin cycle

144. In the following palindromic base sequences of DNA, which one can be cut easily by particular restriction enzyme?

(1) 5' C T C A G T 3' ; 3' G A G T C A 5'

(2) 5'T A TT C 3' ; 3' CAT A A G 5'

(3) 5'G A T A C T 3' ; 3' C T A T G A 5'

(4) 5' G A A T T C 3' ; 3' Y C T T A A G 5'

Sol. Answer (4)

Palindromic base sequence of DNA is one that reads the same in 5′ → 3′ and 3′ → 5′ direction

5′-G↓AATTC – 3′ This is the recognition

3′-CTTAA↑G – 5′ Site for EcoRI enzyme.

145. The entire fleet of buses in Delhi were converted to CNG from diesel. In reference to this, which one of the following statements is false?

(1) It is cheaper than diesel

(2) It can not be adulterated like diesel

(3) CNG burns more efficiently than diesel

(4) The same diesel engine is used in CNG buses making the cost of conversion low

Sol. Answer (4)

Same diesel engine cannot be used in CNG buses.

146. Addition of more solutes in a given solution will:

(1) make its water potential zero .

(2) not affect the water potential at all

(3) raise its water potential

(4) lower its water potential

Sol. Answer (4)

Water potential is a measure of free energy in water (closed system)

When more solute is added to a given solution the free energy of water decreased further, so it would further lower its water potential (less negative to more negative)

147. Transposons can be used during which one of the following?

(1) Autoradiography

(2) Gene sequencing

(3) Polymerase Chain Reaction

(4) Gene silencing

Sol. Answer (4)

Transposons are “jumping genes” or mobile genetic elements that replicate via RNA intermediate and can induce RNA interference by introducing complementary RNA in eukaryotic cell. RNAi technology is developed based on gene silencing mechanism.

148. While explaining interspecific interaction of population, (+) sign is assigned for beneficial interaction, (-) sign is assigned for detrimental interaction and (0) for neutral interaction. Which of the following interactions can be assigned (+) for one species and (-) for another species involved in the interaction ?

(1) Commensalism (2) Competition

(3) Predation (4) Amensalism

Sol. Answer (3)

The interspecific interactions are of numerous types. The interaction in which one species is negatively affected and the other species is positively affected is predation

Predation – species – A (+) – species B (-)

Commensalism – (+/o)

Competition – (-/-)

Amensalism – (-/o)

149. If a geneticist uses the blind approach for sequencing the whole genome of an organism, followed by assignment of function to different segments, the methodology adopted by him is called as

(1) Expressed sequence tags

(2) Bioinformatics

(3) Sequence annotation

(4) Gene mapping

Sol. Answer (3)

In Human genome project, two methodologies/approaches were used to

The method by which the whole genome was sequenced and later coding and non coding regions were identified and functions were annotated. This method is known as sequence Annotation.

150. Which of the following occurs due to the presence of autosome linked dominant trait?

(1) Haemophilia

(2) Thalessemia

(3) Sickle cell anaemia

(4) Myotonic dystrophy

Sol. Answer (4)

Myotonic dystrophy is an autosomal dominant gene disorder.

Affected people have muscle degeneracy. **101.** Which one of the following statement is not true regarding gel electrophoresis technique?

(1) The presence of chromogenic substrate give blue coloured DNA bands on the gel

(2) Bright orange coloured bands of DNA can be observed in the gel when exposed to UV light

(3) The process of extraction of separated DNA strands from gel is called elution.

(4) The separated DNA fragments are stained by using ethidium bromide.

Sol. Answer (1)

Explanation: The use of chromogenic substrate is used during genetic engineering, not during Gel electrophoresis.

102. Given below are two statements

Statement I:

Mendel studied seven pairs of contrasting traits in pea plants and proposed the Laws of Inheritance.

Statement II :

Seven characters examined by Mendel in his experiment on pea plants were seed shape and colour, flower colour, pod shape and colour, flower position and stem height

In the light of the above statements, choose the correct answer from the options given below:

(1) **Statement I** is correct but **Statement II** is incorrect

(2) **Statement I** is incorrect but **Statement II** is correct

(3) Both **Statement I** and **Statement II** are correct

(4) Both **Statement I** and **Statement II** are incorrect

Sol. Answer (3)

Explanation: Both the statements are correct

103. Which of the following is incorrectly matched?

(1) *Porphyra* - Floridian Starch

(2) *Volvox* - Starch

(3) *Ectocarpus* - Fucoxanthin

(4) *Ulothrix* - Mannitol

Sol. Answer (4)

Explanation: The reserve food material found in *Ulothrix* (Green alga) is Starch.

104. XO type of sex determination can be found in :

(1) Grasshoppers

(2) Monkeys

(3) *Drosophila*

(4) Birds

Sol. Answer (1)

XO type of sex determination can be found in Grasshopper.

105. The appearance of recombination nodules on homologous chromosomes during meiosis characterizes:

(1) Sites at which crossing over occurs

(2) Terminalization

(3) Synaptonemal complex

(4) Bivalent

Sol. Answer (1)

Explanation: The appearance of recombination nodules on homologous chromosomes during meiosis characterizes the sites at which crossing over occurs.

106. Which of the following is **not** a method of ex situ conservation?

(1) Micropropagation

(2) Cryopreservation

(3) *Invitro* fertilization

(4) National Parks

Sol. Answer (4)

National parks are the example of in-situ conservation.

107. Identify the incorrect statement related to Pollination:

(1) Flowers produce, foul odours to attract flies and beetles to get pollinated

(2) Moths and butterflies are the most dominant pollinating agents among insects

(3) Pollination by water is quite rare in flowering plants

(4) Pollination by wind is more common amongst abiotic pollination

Sol. Answer (2)

Explanation: The most dominant pollinating agent among insects are Bees (80%).

108. Given below are two statements:

Statement I:

The primary CO_2 acceptor in C_4 plants is phosphoenolpyruvate and is found in the

mesophyll cells

Statement II:

Mesophyll cells of C4 plants lack RuBisCo enzyme. In the light of the above statements, choose the correct answer from the options given below:

(1) **Statement I** is correct but **Statement II** is incorrect

(2) **Statement I** is incorrect but **Statement II** is correct

(3) Both **Statement I** and **Statement II** are correct

(4) Both **Statement I** and **Statement II** are incorrect

Sol. Answer (3)

Explanation: The primary acceptor of CO_2 in C4 plants is PEP and is found in the mesophyll cells, whereas Rubisco enzyme is found in the bundle sheath cells where it helps in fixing CO_2 through C_3 cycle.

109. In old trees the greater part of secondary xylem is dark brown and resistant to insect attack due to:

(a) secretion of secondary metabolites and their deposition in the lumen of vessels.

(b) deposition of organic compounds like tannins and resins in the central layers of stem.

(c) deposition of suberin and aromatic substances in the outer layer of stem.

(d) deposition of tannins, gum, resin and aromatic substances in the peripheral layers of stem.

(e) presence of parenchyma cells, functionally active xylem elements and essential oils.

Choose the correct answer from the options given below:

(1) (d) and (e) Only

(2) (b) and (d) Only

(3) (a) and (b) Only

(4) (c)and(d)Only)

Sol. Answer (3)

Explanation: In older trees the greater part of secondary xylem is dark brown and resistant to insect attack due to secretion of secondary metabolites and their deposition in the lumen of vessels and deposition of organic compounds like tannins and resins in the central layer of stem.

110. Which one of the following produces nitrogen fixing nodules on the roots of *Alnus*?

(1) *Rhodospirillum*

(2) *Beijernickia*

(3) *Rhizobium*

(4) *Frankia*

Sol. Answer (4)

Explanation: *Frankia* is a gram positive species of actinomycete filamentous bacterium that lives in symbiosis with actinorhizal plants in the genus *Alnus*.

111. Given below are two statements:

Statement I :

Decomposition is a process in which the detritus is degraded into simpler substances by microbes.

Statement II :

Decomposition is faster if the detritus is rich in lignin and chitin

In the light of the above statements, choose the correct answer from the options given below :

(1) **Statement I** is correct but **Statement II** is incorrect

(2) **Statement I** is incorrect but **Statement II** is correct

(3) Both **Statement I** and **Statement II** are correct

(4) Both **Statement I** and **Statement II** are incorrect

Sol. Answer (1)

Explanation: Decomposition is the process of conversion of complex organic matter into simple inorganic matter. Under different environmental conditions, the rate of decomposition may vary. If detritus is rich in lignin and chitin, the rate of decomposition is low and for nitrogen rich detritus rate of decompostion is fast.

112. Habitat loss and fragmentation, over exploitation, alien species invasion and co-extinction are causes for:

(1) Biodiversity loss

(2) Natality

(3) Population explosion

(4) Competition

Sol. Answer (1)

Explanation: The evil quartet for biodiversity loss are

1. Habitat loss and fragmentation
2. Over exploitation
3. Alien species invasion
4. Co-extinction

113. Hydrocolloid carrageen is obtained from:

(1) Rhodophyceae only

(2) Phaeophyceae only

(3) Chlorophyceae and Phaeophyceae

(4) Phaeophyceae and Rhodophyceae

Sol. Answer (1)

Explanation: Hydrocolloid carrageen is obtained from red algae.

114. "Girdling Experiment" was performed by Plant Physiologists to identify the plant tissue through which:

(1) for both water and food transportation

(2) osmosis is observed

(3) water is transported

(4) food is transported

Sol. Answer (4)

Girdling experiment demonstrate that phloem is responsible for translocation of food because the phloem is present outside the xylem, so when a ring of bark is removed from a woody plant, the woody xylem part remains intact, which causes the water and the nutrients to reach the least.

115. The flowers are Zygomorphic in:

(a) Mustard

(b) Gulmohar

(c) *Cassia*

(d) *Datura*

(e) Chilly

Choose the correct answer from the options given

(1) (d), (e) Only

(2) (c), (d), (e) Only

(3) (a), (b), (c) Only

(4) (b), (c) Only

Sol. Answer (4)

Examples of zygomorphic flowers :

Gulmohar and *Cassia*

Examples of Actinomorphic flowers :

Mustard, *Datura* and Chilly

116. Which one of the following is not true regarding the release of energy during ATP synthesis through chemiosmosis ? It involves :

(1) Movement of protons across the membrane to the stroma

(2) Reduction of NADP to $NADPH_2$ on the stroma side of the membrane

(3) Breakdown of proton gradient

(4) Breakdown of electron gradient

Sol. Answer (4)

Explanation: According to chemiosmotic hypothesis, there is a breakdown of proton gradient by the movement of protons across the membrane to the stroma and reduction of NADP to NADPH2 on the stroma side of the membrane.

117. The device which can remove particulate matter present in the exhaust from a thermal power plant is:

(1) Electrostatic Precipitator

(2) Catalytic Convertor

(3) STP

(4) Incinerator

Sol. Answer (1)

Electrostatic Precipitators (ESP) are very efficient devices which remove 99% of the particulate present in the industrial and thermal plant exhaust.

118. Given below are two statements: one is labelled as **Assertion (A)** and other is labelled as **Reason (R).**

Assertion (A) :

Polymerase chain reaction is used in DNA amplification

Reason (R):

The ampicillin resistant gene is used as a selectable marker to check transformation

In the light of the above statements, choose the correct answer from the options given below:

(1) **(A)** is correct but **(R)** is not correct

(2) **(A)** is not correct but **(R)** is correct

(3) Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**

(4) Both **(A)** and **(R)** are correct but **(R)** is not the correct explanation of **(A)**

Sol. Answer (4)

- PCR enables the amplification of billions of copies of temtlate DNA.
- Antibiotic resistance genes *i.e.* amplicillin resistant and tetracycline resistant gene act as selectable markers to distinguish between transformant and non transformant, recombinant and non recombinant.

119. Which one of the following plants does not show plasticity?

(1) Buttercup

(2) Maize

(3) Cotton

(4) Coriander

Sol. Answer (2)

Plants follow different pathways in response to environment or phases of life to form different kinds of structures The ability is called plasticity, e.g., heterophylly in cotton, coriander and larkspur. In such plants, the leaves of the juvenile plant are different in shape from those in mature plants.

120. The process of translation of mRNA to proteins begins as soon as

(1) Both the subunit join together to bind rRNA

(2) The tRNA is activated and the larger subunit of ribosome encounters mRNA

(3) The small subunit of ribosome encounter mRNA

(4) The larger subunit of ribosome encounter mRNA

Sol. Answer (3)

Process of translation begins when small subunit of ribosome encounter mRNA.

121. Read the following statements and choose the set of correct statements

(a) Euchromatin is loosely packed chromatin

(b) Heterochromatin is transcriptionally active

(c) Histone octomer is wrapped by negative charged DNA in nucleosome

(d) Histones are rich in lysine and arginine

(e) A typical nucleosome contains 400 bp of DNA helix

Choose the correct answer from the options given below:

(1) (b), (e) Only

(2) (a),(c),(e)Only

(3) (b),(d),(e)Only

(4) (a), (c), (d) Only

Sol. Answer (4)

Euchromatin is loosely, lightly stained chromatin.

Heterochromatin is transcriptionally inactive.

A typical nucleosome contains 200 bp of DNA helix

122. Read the following statements about the vascular bundles :

(a) In roots, xylem and phloem in a vascular bundle are arranged in an alternate manner along the different radii.

(b) Conjoint closed vascular bundles do not possess cambium

(c) In open vascular bundles, cambium is present in between xylem and phloem

(d) The vascular bundles of dicotyledonous stem possess endarch protoxylem

(e) In monocotyledonous root, usually there are more than six xylem bundles present

Choose the correct answer from the options given below

(1) (a), (b), (c) and (d) Only

(2) (a), (c), (d) and (e) Only

(3) (a), (b) and (d) Only

(4) (b), (c), (d) and (e) Only

Sol. NA

123. Exoskeleton of arthropods is composed of

(1) Chitin

(2) Glucosamine

(3) Cutin

(4) Cellulose

Sol. Answer (1)

The exoskeleton of arthropods is composed of Chitin.

124. What is the net gain of ATP when each molecule of glucose is converted to two molecules of pyruvic acid?

(1) Two

(2) Eight

(3) Four

(4) Six

Sol. Answer (1)

One molecule of glucose undergoes glycolysis to form 4 molecules of ATP, two are used in activation phase so net gain is of 2 ATP.

125. Which of the following is not observed during apoplastic pathway?

(1) The movement is aided by cytoplasmic streaming

(2) Apoplast is continuous and does not provide any barrier to water movement.

(3) Movement of water occurs through intercellular spaces and wall of the cells

(4) The movement does not involve crossing of cell membrane

Sol. Answer (1)

Apoplastic pathway is not aided by cytoplasmic streaming

Cytoplasmic streaming helps in symplastic pathway.

126. Which one of the following plants shows vexillary aestivation and diadelphous stamens?

(1) *Allium cepa*

(2) *Solanum nigrum*

(3) *Colchicum*

(4) *Pisum sativum autumnale*

Sol. Answer (4)

Vexillary Aestivation and Diadelphous statements are feature of Fabaceae

Pisum sativum – Fabaceae

Solanum – Solanaceae

Colchicum, *Allium* – Liliaceae

127. DNA polymorphism forms the basis of:

(1) Both genetic mapping and DNA finger printing

(2) Translation

(3) Genetic mapping

(4) DNA finger printing

Sol. Answer (1)

DNA polymorphism is the basis of genetic mapping of genome and of DNA fingerprinting.

128. What amount of energy is released from glucose during lactic acid fermentation

(1) About 10%

(2) Less than 7%

(3) Approximately 15%

(4) More than 18%

Sol. Answer (2)

Less than 7% of energy is released in lactic acid and alcoholic fermentation

129. Identify the correct set of statements:

(a) The leaflets are modified into pointed hard thorns in Citrus and Bougainvillea

(b) Axillary buds form slender and spirally coiled tendrils in cucumber and pumpkin

(c) Stem is flattened and fleshy in Opuntia and modified to perform the function of leaves

(d) *Rhizophora* shows vertically upward growing roots that help to get oxygen for respiration

(e) Subaerially growing stems in grasses and strawberry help in vegetative propagation

Choose the correct answer from the options given below :

(1) (b), (c), (d) and (e) Only

(2) (a), (b), (d) and (e) Only

(3) (b) and (c) Only

(4) (a) and (d) Only

Sol. Answer (1)

Adventitious buds and not leaflets are modified into pointed hard thorns in Citrus and Bougainvillea

130. Which one of the following statements cannot be connected to Predation?

(1) Both the interacting species are negatively impacted

(2) It is necessitated by nature to maintain the ecological balance

(3) It helps in maintaining species diversity in a community

(4) It might lead to extinction of a species

Sol. Answer (1)

In Predation interaction, is + - i.e for species (Host) it is beneficial and for others (Prey) it is detrimental

131. Given below are two statements:

Statement I: Cleistogamous flowers are invariably autogamous

Statement II: Cleistogamy is disadvantageous as there is no chance for cross pollination

In the light of the above statements, choose the correct answer from the options given below :

(1) **Statement I** is correct but **Statement II** is incorrect

(2) **Statement** I is incorrect but Statement II is correct

(3) Both **Statement I** and **Statement II** arecorrect

(4) Both **Statement I** and **Statement II** are incorrect

Sol. Answer (3)

Both the statements are correct.

Cleistogamous flowers are close flowers so they are invariably autogamous and there is no chance of cross pollination due to which genetic diversity is reduced

132. Production of Cucumber has increased manifold in recent years. Application of which of the following phytohormones has resulted in this increased yield as the hormone is known to produce female flowers in the plants :

(1) Ethylene (2) Cytokinin

(3) ABA (4) Gibberellin

Sol. Answer (1)

In cucumbers, ethylene is responsible for promoting female flower production and thereby increasing the yield.

133. Match List- I with List- II.

(a) Manganese	(i) Activates the enzyme catalase
(b) Magnesium	(ii) Required for pollen germination
(c) Boron	(iii) Activates enzymes of respiration
(d) Iron	(iv) Functions in splitting of water during photosynthesis

Choose the **correct answer** from the options given below

(1) (a)-(iv), (b)- (i),(c)-(ii), (d)-(iii)

(2) (a)- (iii), (b)-(i), (c)-(ii), (d)- (iv)

(3) (a)-(iii), (b)- (iv), (c)-(i), (d)-(ii)

(4) (a)-(iv), (b)- (iii), (c)- (ii), (d)-(i)

Sol. Answer (4)

Iron – Activate catalase

Boron – Help in pollen germination

Manganese – Plays major role in splitting of water and release of oxygen during photosynthesis

Magnesium – Activate several enzymes during photosynthesis and respiration.

134. Which one of the following never occurs during mitotic cell division?

(1) Pairing of homologous chromosomes

(2) Coiling and condensation of the chromatids

(3) Spindle fibres attach to kinetochores of chromosomes

(4) Movement of centrioles towards opposite poles

Sol. Answer (1)

Pairing of homologous chromosome (Synapsis) occurs during meiosis

135. The gaseous plant growth regulator is used in plants to:

(1) help overcome apical dominance

(2) kill dicotyledonous weeds in the fields

(3) speed up the malting process

(4) promote root growth and root hair formation to increase the absorption surface

Sol. Answer (4)

Gaseous plant growth regulator is ethylene which helps in root growth and root hair absorption and therefore increases the surface area for absorption

136. Match the plant with the kind of life cycle it exhibits:

List-I	List-II
(a) *Spirogyra*	(i) Dominant diploid sporophyte vascular plant, with highly reduced male or female gametophyte
(b) Fern	(ii) Dominant haploid free-living gametophyte
(c) *Funaria*	(iii) Dominant diploid sporophyte alternating with reduced gametophyte called prothallus
(b) *Cycas*	(iv) Dominant haploid leafy gametophyte alternating with partially dependent multicellular sporophyte

Choose the correct answer from the options given below:

(1) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

(2) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

(3) (a)- (iv),(b)-(i), (c)-(ii), (d)- (iii)

(4) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

Sol. Answer (4)

• *Spirogyra* is a green alage, haplontic life cycle.

• Fern is a pteridophyte – Life cycle shows dominant diploid sporophyte, alternating with reduced free living gametophytic stage. So its Haplo-diplontic life cycle

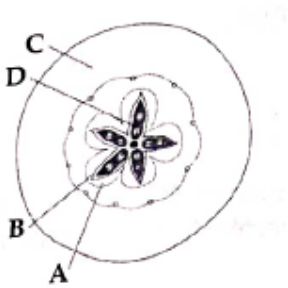
• *Funaria* – belongs to Bryophyta. Its a moss plant. Exhibits haplo diplontic lifecycle.

The free living haploid gametophyte bears the sporophytic plant body.

• *Cycas* – Gymnosperms.

Gymnosperms exhibit dominant diploid saprophytic plant body, with highly reduced male/female gametophyte.

137. Which part of the fruit, labelled in the given figure makes it a false fruit?



(1) C → Thalamus (2) D → Seed

(3) A → Mesocarp (4) B → Endocarp

Sol. Answer (1)

C → Thalamus

A fruit developed from fertilized ovary is true fruit.

Thalamus becomes fleshy and grows around the true fruit. This fleshy, juicy thalamus is edible part in apple. Hence it is a False fruit.

138. Which one of the following will accelerate phosphorus cycle ?

(1) Weathering of rocks

(2) Rainfall and storms

(3) Burning of fossil fuels

(4) Volcanic activity

Sol. Answer (1)

Phosphorus cycle – 'P' is sedimentary cycle.

The natural source of phosphates is phosphate rich rocks. So, phosphorus is obtained from weathering of phosphate rich rocks. Reservoir of 'P' is earths crust.

139. Match List - I with List - II.

List-I	List-II
(a) Metacentric chromosome	(i) Centromere situated close to the end forming one extremely short and one very longar
(b) Acrocentric chromosome	(ii) Centromere at the terminal end
(c) Sub- metacentric	(iii) Centromere in the middle forming two equal arms chromosomes
(d) Telocentric chromosome	Centromere slightly away from the middle forming one shorter arm and one longer arm

Choose the correct answer from the options given below:

(1) (a)-(ii), (b)-(iii), (c)- (iv), (d)-(i)

(2) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

(3) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

(4) (a)-(i), (b)- (iii), (c)- (ii), (d)- (iv)

Sol. Answer (3)

(a) Meta centric chromosome	-	Centromere is at the middle. Forms two equal arms of the chromosome
(b) Acrocentric chromosome	-	Position of centromer is close to the end – forms one very short arm and one very long arm.
c. Sub meta centric chromosome	-	Position of centromer is slightly away from the middle, as a result – one arm is shorter and one arm is onger.
d. Telocentric chromosome	-	Centromere is located terminal end.

140. The anatomy of springwood shows some peculiar features. Identify the correct set of statements about0020springwood.

(a) It is also called as the earlywood

(b) In spring season cambium produces xylem elements with narrow vessels

(c) It is lighter in colour

(d) The springwood along with autumnwood shows alternate concentric rings forming annual rings

(e) It has lower density

Choose the correct answer from the options given below:

(1) (a), (b) and (d) Only

(2) (c), (d) and (e) Only

(3) (a), (b), (d) and (e) Only

(4) (a), (c), (d) and (e) Only

Sol. Answer (4)

Based on the activity of cambium, in temperate regions – two types of woods ae conspicuously seen.

Cambium is more active during spring season, produce large no. of xylary elements with wide cavities and low density

During winters, cambium is less active, produce narrow xylary elements which are more dense – Autumn wood. Autumn wood also called as latewood

One ring of spring wood, one ring of autumn wood as alternate concentric rings – form one Annual ring

141. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason

Assertion (A): Mendel's law of Independent assortment does not hold good for the genes that are located closely on the same chromosome.

Reason (R): Closely located genes assort independently.

In the light of the above statements, choose the correct answer from the options given below:

(1) (A) is correct but **(R)** is not correct

(2) **(A)** is not correct but **(R)** is correct

(3) Both (A) and **(R)** are correct and **(R)** is the correct explanation of (A)

(4) Both **(A)** and **(R)** are correct but **(R)** is not the correct explanation of **(A)**

Sol. Answer (1)

Mendel's law of independent assortment based on dihybrid cross stated that when the inheritance pattern of two pair of genes were combinedly observed the segregation of one pair of alleles is independent of another pair of alleles. This law is true only when

• genes are present on separate chromosomes

• genes present on same chromosome but distantly placed from each other.

142. Read the following statements on lipids and find out correct set of statements:

(a) Lecithin found in the plasma membrane is a glycolipid

(b) Saturated fatty acids possess one or more c = c bonds

(c) Gingelly oil has lower melting point, hence remains as oil in winter

(d) Lipids are generally insoluble in water but soluble in some organic solvents

(e) When fatty acid is esterified with glycerol, monoglycerides are formed

Choose the correct answer from the options given below:

(1) (c), (d) and (e) only

(2) (a), (b) and (d) only

(3) (a), (b) and (c) only

(4) (a), (d) and (e) only

Sol. Answer (1)

Lecithin is a phospholipid, saturated fatty acids lack double bonds.

143. What is the role of large bundle shealth cells found around the vascular bundles in C_4 plants?

(1) To enable the plant to tolerate high temperature

(2) To protect the vascular tissue from high light intensity

(3) To provide the site for photorespiratory pathway

(4) To increase the number of chloroplast for the operation of Calvin cycle

Sol. Answer (4)

C4 plant has Kranz anatomy – large number of Bundle sheath cells around vascular bundles help for two things.

(a) makes these cells impervious to gases

(b) increase the number of chloroplasts for operation of Calvin cycle

144. In the following palindromic base sequences of DNA, which one can be cut easily by particular restriction enzyme?

(1) 5' C T C A G T 3' ; 3' G A G T C A 5'

(2) 5'T A TT C 3' ; 3' CAT A A G 5'

(3) 5'G A T A C T 3' ; 3' C T A T G A 5'

(4) 5' G A A T T C 3' ; 3' Y C T T A A G 5'

Sol. Answer (4)

Palindromic base sequence of DNA is one that reads the same in 5′ → 3′ and 3′ → 5′ direction

5′-G↓AATTC – 3′ This is the recognition

3′-CTTAA↑G – 5′ Site for EcoRI enzyme.

145. The entire fleet of buses in Delhi were converted to CNG from diesel. In reference to this, which one of the following statements is false?

(1) It is cheaper than diesel

(2) It can not be adulterated like diesel

(3) CNG burns more efficiently than diesel

(4) The same diesel engine is used in CNG buses making the cost of conversion low

Sol. Answer (4)

Same diesel engine cannot be used in CNG buses.

146. Addition of more solutes in a given solution will:

(1) make its water potential zero .

(2) not affect the water potential at all

(3) raise its water potential

(4) lower its water potential

Sol. Answer (4)

Water potential is a measure of free energy in water (closed system)

When more solute is added to a given solution the free energy of water decreased further, so it would further lower its water potential (less negative to more negative)

147. Transposons can be used during which one of the following?

(1) Autoradiography

(2) Gene sequencing

(3) Polymerase Chain Reaction

(4) Gene silencing

Sol. Answer (4)

Transposons are “jumping genes” or mobile genetic elements that replicate via RNA intermediate and can induce RNA interference by introducing complementary RNA in eukaryotic cell. RNAi technology is developed based on gene silencing mechanism.

148. While explaining interspecific interaction of population, (+) sign is assigned for beneficial interaction, (-) sign is assigned for detrimental interaction and (0) for neutral interaction. Which of the following interactions can be assigned (+) for one species and (-) for another species involved in the interaction ?

(1) Commensalism (2) Competition

(3) Predation (4) Amensalism

Sol. Answer (3)

The interspecific interactions are of numerous types. The interaction in which one species is negatively affected and the other species is positively affected is predation

Predation – species – A (+) – species B (-)

Commensalism – (+/o)

Competition – (-/-)

Amensalism – (-/o)

149. If a geneticist uses the blind approach for sequencing the whole genome of an organism, followed by assignment of function to different segments, the methodology adopted by him is called as

(1) Expressed sequence tags

(2) Bioinformatics

(3) Sequence annotation

(4) Gene mapping

Sol. Answer (3)

In Human genome project, two methodologies/approaches were used to

The method by which the whole genome was sequenced and later coding and non coding regions were identified and functions were annotated. This method is known as sequence Annotation.

150. Which of the following occurs due to the presence of autosome linked dominant trait?

(1) Haemophilia

(2) Thalessemia

(3) Sickle cell anaemia

(4) Myotonic dystrophy

Sol. Answer (4)

Myotonic dystrophy is an autosomal dominant gene disorder.

Affected people have muscle degeneracy.

151. Natural selection where more individuals acquire specific character value other than the mean character value, leads to:

(1) Disruptive change

(2) Random change

(3) Stabilising change

(4) Directional change

Sol. Answer (4)

Directional selection occurs if selection does not favour the mean character value, rather it favors the extreme value and only in one direction.

For example, Industrial melanism

152. Given below are two statements:

Statement I: Mycoplasma can pass through less than 1 micron filter size.

Statement II : Mycoplasma are bacteria with cell wall.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement I is correct but Statement II is incorrect

(2) Statement I is incorrect but Statement II is correct

(3) Both Statement I and Statement II are correct

(4) Both Statement I and Statement II are incorrect

Sol. Answer (1)

Mycoplasma can pass through less than 1 micron filter size.

Mycoplasma are bacteria without a cell wall, so statement 2 is incorrect.

153. A dehydration reaction links two glucose molecules to produce maltose. If the formula for glucose is $C_6H_{12}O_6$.then what is the formula for maltose?

(1) $C_{12}H_{22}O_{11}$

(2) $C_{12}H_{24}O_{11}$

(3) $C_{12}H_{20}O_{10}$

(4) $C_{12}H_{24}O_{12}$

Sol. Answer (1)

$(C_6H_{12}O_6 + C_6H_{12}O_6) – H_2O = C_{12}H_{22}O_{11}$.

One water molecule is removed during glyosidic bond formation.

154. Which of the following statement with respect to Endoplasmic Reticulum is incorrect?

(1) In prokaryotes only RER are present

(2) SER are the sites for lipid synthesis

(3) RER has ribosomes attached to ER

(4) SER is devoid of ribosomes

Sol. Answer (1)

In prokaryotes, membrane bound organelles like endoplasmic reticulum is absent.

Rest all statement are correct.

155. Tegmina in cockroach, arises from:

(1) Metathorax

(2) Prothorax and Mesothorax

(3) Prothorax

(4) Mesothorax

Sol. Answer (4)

Tegmina in cockroach arises from mesothroax. They are not used for flight but cover and protect the metathoracic wings.

156. If the length of a DNA molecule is 1.1 metres, what will be the approximate number of base pairs?

(1) 3.3×10^6 bp

(2) 6.6×10^6 bp

(3) 3.3×10^9 bp

(4) 6.6×10^9 bp

Sol. Answer (3)

In 2.2 meters of length of DNA, 6.6×10^9 bp are present, so in half length i.e. 1.1 meters 3.3×10^9 bp should be present.

157. Identify the asexual reproductive structure associated with *Penicillium*:

(1) Gemmules

(2) Buds

(3) Zoospores

(4) Conidia

Sol. Answer (4)

Penicillium belongs to Ascomycetes.

In ascomycetes asexual reproductive structure is conidia.

158. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A):

All vertebrates are chordates but all chordates are not vertebrates.

Reason (R):

Notochord is replaced by vertebral column in the adult vertebrates

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) (A) is correct but (R) is not correct

(2) (A) is not correct but (R) is correct

(3) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(4) Both (A) and (R) are correct but (R) is not correct explanation of (A)

Sol. Answer (3)

Chordates include Urochordates, Cephalochordates (protochordates) and vertebrates. In vertebrates notochord is replaced by vertebral column, however vertebral column is not present in protochordates. Therefore, All vertebrates are chordates but all chordates are not vertebrates.

159. Breeding crops with higher levels of vitamins and minerals or higher proteins and healthier fats is called:

(1) Bio-fortification

(2) Bio-accumulation

(3) Bio-magnification

(4) Bio-remediation

Sol. Answer (1)

Biofortification is breeding crops with higher level of vitamins and minerals, proteins and healthier fats.

160. Under normal physiological conditions in human being every 100 ml of oxygenated blood can deliver _____ ml of O_2 to the tissues.

(1) 4 ml

(2) 10 ml

(3) 2 ml

(4) 5 ml

Sol. Answer (4)

Every 100 ml of oxygenated blood delivers about 5 ml of oxygen to the tissues under normal physiological conditions.

161. In which of the following animals, digestive tract has additional chambers like crop and gizzard?

(1) *Catla, Columba, Crocodilus*

(2) *Pavo, Psittacula, Corvus*

(3) *Corvus, Columba, Chameleon*

(4) *Bufo, Balaenoptera, Bangarus*

Sol. Answer (2)

The digestive tract of Aves has additional chambers in their digestive system as crop (for storage of food) and Gizzard (mastication of food).

Pavo-Peacock, *Psittacula-Parrot*, *Corvus*-crow

162. Which of the following functions is **not** performed by secretions from salivary glands?

(1) Lubrication of oral cavity

(2) Digestion of disaccharides

(3) Control bacterial population in mouth

(4) Digestion of complex carbohydrates

Sol. Answer (2)

Disaccharides are digested by disaccharidases in intestinal juice.

163. Nitrogenous waste is excreted in the form of pellet or paste by :

(1) *Hippocampus*

(2) *Pavo*

(3) *Ornithorhynchus*

(4) *Salamandra*

Sol. Answer (2)

Reptiles (e.g. lizards), birds, land snails and insects excrete nitrogenous wastes, as uric acid in the form of pellet or paste and are called as uricotelic animals.

164. In an E. *Coli* strain i gene gets mutated and its product can not bind the inducer molecule. If growth medium is provided with lactose, what will be the outcome?

(1) z, y, a genes will not be translated

(2) RNA polymerase will bind the promoter region

(3) Only z gene will get transcribed

(4) z, y, a genes will be transcribed

Sol. Answer (1)

Product of i gene is repressor and if it cannot bind with inducer (lactose), so it will bind at operator region and will prevent RNA polymerase from transcribing the operon.

If transcription of z, y, a gene will not occur then translation will also not occur.

165. Which of the following is present between the adjacent bones of the vertebral column?

(1) Areolar tissue

(2) Smooth muscle

(3) Intercalated discs

(4) Cartilage

Sol. Answer (4)

Between two adjacent vertebrae, a disc or pad of fibrous cartilage is present called intervertebral disc. It provides flexibility to vertebral column.

166. Given below are two statements :

Statement I :

Fatty acids and glycerols cannot be absorbed into the blood.

Statement II :

Specialized lymphatic capillaries called lacteals carry chylomicrons into lymphatic vessels and ultimately into the blood.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) **Statement I** is correct but **Statement II** is incorrect

(2) **Statement I** is incorrect but **Statement II** is correct

(3) Both **Statement I** and **Statement II** are correct

(4) Both **Statement I** and **Statement II** are incorrect

Sol. Answer (3)

Fatty acids and glycerol being insoluble cannot be absorbed into the blood. They are first incorporated into small droplets called micelles which move into intestinal mucosa. They are re-formed into very small protein coated fat globules called chylomicrons which are transported into lymph capillaries(lacteals) in the villi. These release chylomicrons into lymph vessels which ultimately release absorbed substances into the bloodstream.

167. Select the incorrect statement with reference to mitosis:

(1) Chromosomes decondense at telophase

(2) Splitting of centromere occurs at anaphase

(3) All the chromosomes lie at the equator at metaphase

(4) Spindle fibres attach to centromere of chromosomes

Sol. Answer (4)

Explanation : During metaphase, spindle fibres attach to kinetochore and chromatin fibres starts condensing at prophase and chromosomes decondense at telophase.

168. Given below are two statements:

Statement I :

The release of sperms into the seminiferous tubules is called spermiation.

Statement II :

Spermiogenesis is the process of formation of sperms from spermatogonia.

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) **Statement I** is correct but **Statement II** is incorrect

(2) **Statement I** is incorrect but **Statement II** is correct

(3) Both **Statement I** and **Statement II** are correct

(4) Both **Statement I** and **Statement II** are incorrect)

Sol. Answer (1)

The process conversion of spermatids into spermatozoa is called spermiogenesis.

169. Given below are two statements :

Statement I :

The coagulum is formed of network of threads called thrombins.

Statement II :

Spleen is the graveyard of erythrocytes.

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) **Statement I** is correct but **Statement II** is incorrect

(2) **Statement I** is incorrect but **Statement II** is correct

(3) Both **Statement I** and **Statement II** are correct

(4) Both **Statement I** and **Statement II** are incorrect

Sol. Answer (2)

The coagulum is formed of a network of threads of fibrins.

170. Identify the microorganism which is responsible for the production of an immunosuppressive molecule cyclosporin A :

(1) *Aspergillus niger*

(2) *Streptococcus cerevisiae*

(3) *Trichoderma polysporum*

(4) *Clostridium butylicum*

Sol. Answer (3)

Explanation: Source of cyclosporin is a fungus named *Trichoderma polysporum*. Cyclosporin is an immune suppresent which is used during organ transplant to suppress the immune response.

171. Which of the following statements are true for spermatogenesis but do not hold true for Oogenesis ?

(a) It results in the formation of haploid gametes

(b) Differentiation of gamete occurs after the completion of meiosis

(c) Meiosis occurs continuously in a mitotically dividing stem cell population

(d) It is controlled by the Luteinising hormone (LH) and Follicle Stimulating Hormone (FSH) secreted by the anterior pituitary

(e) It is initiated at puberty

Choose the most appropriate answer from the options given below:

(1) (b), (d) and (e) only

(2) (b), (c) and (e) only

(3) (c) and (e) only

(4) (b) and (c) only

Sol. Answer (2)

Statements (a) and (d) hold true for both spermatogenesis and oogenesis.

172. In-situ conservation refers to:

(1) Conserve only endangered species

(2) Conserve only extinct species

(3) Protect and conserve the whole ecosystem

(4) Conserve only high risk species

Sol. Answer (3)

In situ conservation conserves the whole flora and fauna in their local place. Examples of in-Situ conservations are National parks, wildlife sanctuary and sacred groves etc.

173. Lippe's loop is a type of contraceptive

(1) Non-Medicated IUD

(2) Copper releasing IUD

(3) Cervical barrier

(4) Vault barrier

Sol. Answer (1)

Lippe's Loop is an inert or non-medicated IUD.

174. Which of the following is a correct match for disease and its symptoms ?

(1) Myasthenia gravis - Genetic disorder resulting in weakening and paralysis of skeletal muscle

(2) Muscular dystrophy - An autoimmune.... disorder causing progressive degeneration of skeletal muscle

(3) Arthritis - Inflammed joints

(4) Tetany - high Ca^{2+} level causing rapid spasms.

Sol. Answer (3)

Myasthenia Gravis: Autoimmune disorder affecting neuromuscular junction leading to fatigue, weakening and paralysis of skeletal muscle

Muscular Dystrophy: Progressive degeneration of skeletal muscle mostly due to genetic disorder

Tetany: Rapid spasms in muscles due to low calcium in body fluids.

175. Which of the following is not the function 0f conducting part of respiratory system ?

(1) Temperature of inhaled air is brought to body temperature

(2) Provides surface for diffusion of O_2 and CO_2

(3) It clears inhaled air from foreign particles

(4) Inhaled air is humidified

Sol. Answer (2)

The gaseous exchange is done by the respiratory part of the respiratory system.

176. Regarding Meiosis, which of the statements is incorrect ?

(1) Pairing of homologous chromosomes and recombination occurs in Meiosis-I

(2) Four haploid cells are formed at the end of Meiosis-II

(3) There are two stages in Meiosis, Meiosis-I and II

(4) DNA replication occurs in S phase of Meiosis-II

Sol. Answer (4)

DNA replication always occurs in the S-phase of interphase (both mitosis and meiosis)

In Meiosis-I and II there is no DNA replication.

177. Detritivores breakdown detritus into smaller particles. This process is called :

(1) Humification

(2) Decomposition

(3) Catabolism

(4) Fragmentation

Sol. Answer (4)

The process of the breakdown of detritus into smaller parts by detritus like earthworms called fragmentation.

178. Which of the following is not a connective tissue?

(1) Cartilage

(2) Neuroglia

(3) Blood

(4) Adipose tissue

Sol. Answer (2)

Neuroglial cells are components of nervous tissue.

179. In the taxonomic categories which hierarchical arrangement in ascending order is correct in the case of animals ?

(1) Kingdom, Order, Class, Phylum, Family, Genus, Species

(2) Kingdom, Phylum, Class, Order, Family, Genus, Species

(3) Kingdom, Phylum, Class, Order, Family, Genus, Species

(4) Kingdom, Class, Phylum, Family, Order, Genus, Species

Sol. Answer (3)

The correct hierarchical arrangements in ascending order in animals is species, genus, family, order, class, phylum and kingdom.

180. Given below are two statements:

Statement I

Restriction endonucleases recognise specific sequence to cut DNA known as palindromic nucleotide sequence.

Statement II

Restriction endonucleases cut the DNA strand a little away from the centre of the palindromic site.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement I is correct but Statement II is incorrect

(2) Statement I is incorrect but Statement II is correct

(3) Both Statement I and Statement II are correct

(4) Both Statement I and Statement II are incorrect

Sol. Answer (3)

Both the statements are correct

181. In gene therapy of Adenosine Deaminase (ADA) deficiency, the patient requires periodic infusion of genetically engineered lymphocytes because:

(1) Lymphocytes from patient's blood are grown in culture, outside the body.

(2) Genetically engineered lymphocytes are not immortal cells.

(3) Retroviral vector is introduced into these lymphocytes

(4) Gene isolated from marrow cells producing ADA is introduced into cells at embryonic states

Sol. Answer (2)

The genetically engineered lymphocytes have limited life span. Thus, periodic infusion is required.

182. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A):

Osteoporosis is characterised by decreased bone mass and increased chances o(fractures.

Reason(R):

Common cause of osteoporosis is increased levels of estrogen.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) (A) is correct but (R) is not correct

(2) (A) is not correct but (R) is correct

(3) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(4) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

Sol. Answer (1)

Common cause of osteoporosis is decreased levels of estrogen

183. At which stage of life the oogenesis process is initiated?

(1) Birth

(2) Adult

(3) Puberty

(4) Embryonic development stage

Sol. Answer (4)

Oogenesis starts at embryonic development stage in females.

184. If '8' *Drosophila* in a laboratory population of '80' died during a week, the death rate in the population is _____ individuals per *Drosophila* per week.

(1) 1.0 (2) zero

(3) 0.1 (4) 10

Sol. Answer (3)

Death rate in the population is = $\frac{8}{80} = 0.1$

185. Given below are two statements:

Statement I:

Autoimmune disorder is a condition where body defense mechanism recognizes its own cells as foreign bodies.

Statement II :

Rheumatoid arthritis is a condition where body does not attack self cells.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement I is correct but Statement II is incorrect

(2) Statement I is incorrect but statement II is correct

(3) Both statement I and Statement II are correct

(4) Both Statement I and Statement II are incorrect

Sol. Answer (1)

Rheumatoid arthritis is an autoimmune disorder where body attack self-cells

186. The recombination frequency between the genes a & c is 5%, b & c is 15%, b & d is 9%, a & b is 20%, c & d is 24 and a & d is 29%. What will be the sequence of these genes on a linear chromosome?

(1) a, b, c, d

(2) a, c, b, d

(3) a, d, b, c

(4) d, b, a, c

Sol. Answer (2)

Recombination frequency between genes

ac – 5 %

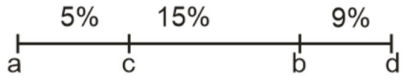
bc – 15 %

bd – 9 %

ab – 20 %

cd – 24 %

ad – 29 %



187. Match List -I with List - II.

List-I (Biological Molecules)	**List-II** (Biological functions)
(a) Glycogen	(i) Hormone
(b) Globulin	(ii) Biocatalyst
(c) Steroids	(iii) Antibody
(d) Thrombin	(iv) Storage product

Choose the correct answer from the options given below:

(1) (a) - (ii), (b) - (iv), (c) - (iii), (d) - (i)

(2) (a) - (iv), (b) - (iii), (c) - (i), (d) - (ii)

(3) (a) - (iii), (b) - (ii), (c) - (iv), (d) - (i)

(4) (a) - (iv), (b) - (ii), (c) - (i), (d) - (iii)

Sol. Answer (2)

Glycogen – Storage form of glucose in animals

Globulin – Fighting infection

Steroids – Hormone

Thrombin – Biocatalyst

188. Which of the following are not the effects of Parathyroid hormone ?

(a) Stimulates the process of bone resorption

(b) Decreases Ca^{2+} level in blood

(c) Reabsorption of Ca^{2+} by renal tubules

(d) Decreases the absorption of Ca^{2+} from digested food

(e) Increases metabolism of carbohydrates

Choose the most **appropriate** answer from the options given below:

(1) (a) and (e) only

(2) (b) and (c) only

(3) (a) and (c) only

(4) (b), (d) and (e) only

Sol. Answer (4)

Increases Ca^{2+} level in blood

Increase the absorption of Ca^{2+} from digested food

No direct relation with metabolism of carbohydrates

189. Which of the following is not a desirable feature of a cloning vector?

(1) Presence of single restriction enzyme site

(2) Presence of two or more recognition sites

(3) Presence of origin of replication

(4) Presence of a marker gene

Sol. Answer (2)

Presence of more than one recognition site within vector will create multiple fragments which will complicate gene cloning.

190. Match **List-I** and **List-II** with respect to methods of Contraception and their respective actions.

List – I	**List – II**
(a) Diaphragms	(i) Inhibit ovulation and Implantation
(b) Contraceptive Pills	(ii) Increase phagocytosis of sperm within Uterus
(c) Intra Uterine Devices	(iii) Absence of Menstrual cycle and ovulation following parturition
(d) Lactational Amenorrhea	(iv) They cover the cervix blocking the entry of sperms

Choose the **correct answer** from the options given below :

(1) (a) - (ii), (b) - (iv), (c) - (i), (d) - (iii)

(2) (a) - (iii), (b) - (ii), (c) - (i), (d) - (iv)

(3) (a) - (iv), (b) - (i), (c) - (iii), (d) - (ii)

(4) (a) - (iv), (b) - (i), (c) - (ii), (d) - (iii)

Sol. Answer (4)

Diaphragms – They cover the cervix and block the entry of sperms

Contraceptive pills – Inhibit ovulation and Implantation

IUDs – Increase phagocytosis of sperm within Uterus

Lactational Amenorrhea – Absence of Menstrual cycle and ovulation following parturition

191. If a colour blind female marries a man whose mother was also colour blind, what are the chances of her progeny having colour blindness?

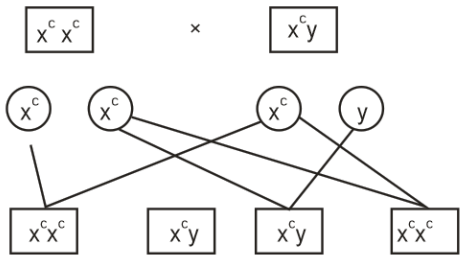
(1) 75% (2) 100%

(3) 25% (4) 50%

Sol. Answer (2)

Color blindness is X-linked recessive disorder.

Female genotype	Male genotype
xx-Normal	xy-Normal
x^cx-Normal, carrier	
x^cx^c-affected	x^cy-affected



Since male gets his x-glvsq swsq i$ from mother, in this case the man is also color blind and as a result, all her progeny are color blind.

192. Which of the following statements is not true?

(1) Homology indicates common ancestry

(2) Flippers of penguins and dolphins are a pair of homologous organs

(3) Analogous structures are a result of convergent evolution

(4) Sweet potato and potato is an example of analogy

Sol. Answer (2)

Flippers of Penguins and Dolphins are a pair of analogous organs

193. Which of the following is a correct statement?

(1) Slime moulds are saprophytic organisms classified under Kingdom Monera.

(2) Mycoplasma have DNA, Ribosome and cell wall

(3) Cyanobacteria are a group of autotrophic organisms classified under Kingdom Monera

(4) Bacteria are exclusively heterotrophic organisms.

Sol. Answer (3)

Cyanobacteria are photosynthetic, autotrophic, prokaryotes. They have chlorophyll a similar to green plants (chief photosynthetic pigment)

Slime moulds are saprophytic organisms classified under kingdom **Protista** not Monera

Mycoplasma are smallest known organisms, they lack a cell wall.

Bacteria are not exclusively heterotrophic, they have diverse nutrition types

194. Select the incorrect statement with respect to acquired immunity.

(1) Anamnestic response is due to memory of first encounter.

(2) Acquired immunity is non-specific type of defense present at the time of birth.

(3) Primary response is produced when our body encounters a pathogen for the first time.

(4) Anamnestic response is elicited on subsequent encounters with the same pathogen

Sol. Answer (2)

Acquired immunity is a specific type of immunity and acquired during life time.

195. Match List-I with List-II.

List- I	List-II
(a) Bronchioles	(i) Dense Regular Connective Tissue
(b) Goblet cell	(ii) Loose Connective Tissue
(c) Tendons	(iii) Glandular Tissue
(d) Adipose Tissue	(iv) Ciliated Epithelium

Choose the correct answer from the options given below:

(1) (a)-(ii), (b)-(i), (c)- (iv), (d)- (iii)

(2) (a)-(iii), (b)- (iv), (c)- (ii), (d)-(i)

(3) (a)- (iv), (b)- (iii), (c)-(i), (d)- (ii)

(4) (a)-(i), (b)- (ii), (c)- (iii), (d)-(iv)

Sol. Answer (3)

(a) Bronchioles – Ciliated Epithelium

(b) Goblet cell – Glandular Tissue

(c) Tendons – Dense Regular Connective Tissue

(d) Adipose Tissue – Loose Connective Tissue

196. Statements related to human Insulin are given below. Which statement(s) is/are correct about genetically engineered Insulin?

(a) Pro-hormone insulin contain extra stretch of C-peptide

(b) A-peptide and B-peptide chains of insulin were produced separately in *E.coli*, extracted and combined by creating disulphide bond between them.

(c) Insulin used for treating Diabetes was extracted from Cattles and Pigs.

(d) Pro-hormone Insulin needs to be processed for converting into a mature and functional hormone.

(e) Some patients develop allergic reactions to the foreign insulin.

Choose the most appropriate answer from the options given below:

(1) (c) and (d) only

(2) (c), (d) and (e) only

(3) (a), (b) and (d) only

(4) (b) only

Sol. Answer (4)

(a), (c), (d) and (e) are not related with genetically engineered Insulin

197. Given below are two statements:

Statement I:

In a scrubber the exhaust from the thermal plant is passed through the electric wires to charge the dust particles.

Statement II:

Particulate matter (PM 2.5) can not be removed by scrubber but can be removed by an electrostatic precipitator.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement I is correct but Statement II is incorrect

(2) Statement I is incorrect but Statement II is correct

(3) Both Statement I and Statement II are correct

(4) Both Statement I and Statement II are incorrect

Sol. Answer (2)

Statement-I is incorrect.

Statement-II is correct

Scrubber is meant to remove gases, like SO2.

Electrostatic precipitator is meant to remove particulate matter. About 99% of particulate matter can be removed from exhaust of thermal powerplants.

198. The *E.coli* cells with ^{15}N-dsDNA are incubated in medium containing ^{14}N nucleotide. After 60 minutes, how may *E.coli* cells will have DNA totally free from ^{15}N?

(1) 60 cells (2) 80 cells

(3) 20 cells (4) 40 cells

Sol. Answer (1)

1 cell with N^{15} DNA after 3 generations or 60 mins will form two cells with hybrid DNA (N^{15}–N^{14}) and 6 cells with light DNA (N^{14}–N^{14})

If we are starting with 10 cells then 60 cells with have only light DNA (N^{14}–N^{14})

199. Select the incorrect statement regarding synapses:

(1) Chemical synapses use neurotransmitters

(2) Impulse transmission across a chemical synapse is always faster than the across an electrical synapse.

(3) The membranes of presynaptic and postsynaptic neurons are in close proximity in an electrical synapse.

(4) Electrical current can flow directly from one neuron into the other across the electrical synapse.

Sol. Answer (2)

Impulse transmission across a chemical synapse is always slower than across an electrical synapse.

200. Which one of the following statements is correct?

(1) Blood moves freely from atrium to the ventricle during joint diastole.

(2) Increased ventricular pressure causes closing of the semilunar valves.

(3) The atrio-ventricular node (AVN) generates an action potential to stimulate atrial contraction

(4) The tricuspid and the bicuspid valves open due to the pressure exerted by the simultaneous contraction of the atria

Sol. Answer (1)

Nearly 70% of ventricles get filled with blood during joint diastole (blood moves freely from atria to ventricles)

Ventricular systole causes closure of AV values

SA node generates action potential to stimulate atrial contraction.

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